Amendments to the Claims

The following is a complete list of claims. The claims below replace all prior versions of the claims in the application.

What is Claimed:

1. (Currently amended) A gateway for using non-IP digital PBX telephone handsets with an IP call controller, comprising:

(a) one or more handset ports for coupling to one or more non-IP digital PBX telephone handsets;

(b) an IP port for coupling to an IP network device; and

(c) a protocol translator circuit that

(i) translates non-IP digital PBX telephone call control signals received at a handset port directly into IP telephone call control signals for an IP telephone call controller and delivers them to the IP port; and

(ii) translates IP telephone call control signals received at the IP port from an IP telephone call controller directly into non-IP digital PBX telephone call control signals and delivers them to the one or more handset ports; and

wherein the gateway is further configured to automatically determine the operating characteristics of handsets coupled to each handset port.

2. (Original) The gateway of claim 1 wherein the protocol translator circuit is programmable such that it can be programmed to operate properly with each of a plurality of protocols for non-IP digital PBX telephone call control signals.

3. (Original) The gateway of claim 1 wherein the protocol translator circuit is programmable such that it can be programmed to operate properly with each of a plurality of protocols for IP telephone call controllers.

4. (Original) The gateway of claim 2 wherein the protocol translator circuit is programmed by IP download via the IP port.

5. (Original) The gateway of claim 3 wherein the protocol translator circuit is programmed by IP download via the IP port.

6. (Original) The gateway of claim 4 wherein the download is initiated in response to establishment of an IP session between the gateway and an IP service.

7. (Original) The gateway of claim 5 wherein the download is initiated in response to establishment of an IP session between the gateway and an IP service.

8. (Original) The gateway of claim 1 wherein, upon receipt at a handset port of one or more predetermined non-IP digital PBX call control signals, instead of or in addition to translating the signal into an IP telephone call control signal, the protocol translator circuit returns a non-IP digital PBX call control signal to the handset port.

9. (Original) The gateway of claim 1 wherein the one or more non-IP digital PBX handset ports includes a first handset port and a second handset port wherein, upon receipt at the first handset port of one or more predetermined non-IP digital PBX call control signals, instead of or in addition to translating the signal into an IP telephone call control signal, the protocol translator circuit sends a non-IP digital PBX call control signal to the second handset port.

10. (Original) The gateway of claim 9 wherein the call control signals are for establishing a voice conference that includes the first and the second handset ports.

11. (Original) The gateway of claim 1 further comprising an address registration circuit that assigns an address for IP communications to each handset port to which a non-IP digital PBX telephone is coupled and registers each address for IP communications with the IP telephone call controller.

12. (Original) The gateway of claim 1 further comprising a registration circuit that registers the gateway with the IP telephone call controller for subsequent system management.

13. (Original) The gateway of claim 1 further comprising a general purpose IP router coupled to the IP port and to one or more IP sub-ports in the gateway for coupling other IP devices to the IP network, where the router gives voice quality preference to IP packets going to or from the one or more telephone handset ports over IP packets going to or from devices coupled to the one or more IP sub-ports.

14. (Original) The gateway of claim 1 having an external form of a plug-in card for an IP telephone call controller where the IP port has an external form for coupling to contacts in said IP telephone call controller.

15. (Currently amended) A system wherein non-IP digital PBX telephone handsets are coupled to an IP telephone call controller in a public telephone network, comprising:

(a) an IP telephone call controller operating a public telephone network according to public IP call control protocols and coupled to the global IP network;

(b) a gateway coupled to the global IP network at a location remote from the IP telephone call controller;

(c) one or more non-IP digital PBX telephone handsets coupled to the gateway via wires for carrying non-IP digital PBX telephone call control signaling between the handset and the gateway;

(d) the gateway having one or more all-digital protocol translating circuits that:

(i) send a set of signals to each non-IP digital PBX telephone handset designed to produce a different response from each of a plurality of different proprietary handsets;

(ii) process the response or responses that are received to identify the type of each non-IP digital PBX telephone handset;

(iii) translate non-IP digital PBX call control signals received from ~~a~~ the handset into IP call control signals according to the public IP call control protocols of the call controller; and

~~(ii)~~(iv) translate IP call control signals from the call controller into non-IP digital PBX call control signals for a handset coupled to the gateway.

16. (Original) The system of claim 15 wherein the gateway further comprises a general purpose IP router coupled to the IP port and to one or more IP sub-ports in the gateway for coupling other IP devices to the global IP network, where the router gives voice quality preference to IP packets going to or from the one or more telephone handsets over IP packets going to or from devices coupled to the IP sub-ports.

17. (Currently amended) A system wherein non-IP digital PBX telephone handsets are coupled to a proprietary IP telephone call controller in a private telephone network, comprising:

(a) a proprietary IP telephone call controller operating according to proprietary IP call control protocols and coupled to the global IP network;

(b) a gateway coupled to the global IP network at a location remote from the call controller;

(c) one or more non-IP digital PBX telephone handsets coupled to the gateway via wires for carrying non-IP digital PBX telephone call control signaling between the handset and the gateway;

(e) the gateway having one or more protocol translating circuits that:

(i) send a set of signals to each non-IP digital PBX telephone handset

designed to produce a different response from each of a plurality of different proprietary handsets;

(ii) process the response or responses that are received to identify the type of each non-IP digital PBX telephone handset;

(iii) directly translate non-IP digital call control signals received from ~~a~~ the handset into IP call control signals according to proprietary IP call control protocols of the call controller; and

~~(ii)~~(iv) directly translate proprietary IP call control signals from the call controller into non-IP digital call control signals for a handset coupled to the gateway.

18. (Original) The system of claim 17 wherein the gateway further comprises a general purpose IP router coupled to the IP port and to one or more IP sub-ports in the gateway for coupling other IP devices to the global IP network, where the router gives voice quality preference to IP packets going to or from the one or more telephone handsets over IP packets going to or from devices coupled to the IP sub-ports.

19. (Currently amended) A system wherein non-IP digital PBX telephone handsets are coupled to a gateway in the form of a plug-in card in a proprietary IP telephone call controller in a private telephone network, comprising:

(a) a proprietary IP telephone call controller operating according to proprietary IP call control protocols and coupled to the global IP network;

(b) a gateway card plugged into the call controller; and

(c) one or more non-IP digital PBX telephone handsets coupled to the gateway card via wires for carrying non-IP digital PBX telephone call control signaling between the handset and the gateway card;

(d) the gateway card having one or more protocol translating circuits that:

(i) send a set of signals to each non-IP digital PBX telephone handset designed to produce a different response from each of a plurality of different proprietary handsets;

(ii) process the response or responses that are received to identify the type of each non-IP digital PBX telephone handset;

(iii) translate non-IP digital call control signals received from ~~a~~ the handset directly into IP call control signals according to proprietary IP call control protocols of the call controller; and

~~(ii)~~(iv) translate proprietary IP call control signals from the call controller directly into non-IP digital call control signals for a handset coupled to the gateway.

20-33. (Canceled)

34. (Currently amended) A method for translating call control signals between an IP network and non-IP digital PBX telephone handsets comprising:

sending to a handset port a set of signals designed to produce a different response from different non-IP digital handsets;

receiving a response from the handset port a response indicative of the type of non-IP digital handset coupled to the handset port;

receiving a first non-IP digital PBX telephone call control signal at ~~a~~ the handset port;

translating the first non-IP digital PBX telephone call control signal directly into a first IP telephone call control signal;

delivering the first IP telephone call control signal to an IP port;

receiving a second IP telephone call control signal at the IP port;

translating the second IP telephone call control signal directly into a second non-IP digital PBX telephone call control signal; and

delivering the second non-IP digital PBX telephone call control signal to the handset port.

35. (Previously Presented) The method for translating call control signals between an IP network and non-IP digital PBX handsets of claim 34 wherein translating telephone call control signals occurs in a protocol translator circuit; and further comprising:

programming the protocol translator circuit to translate telephone call control signals from and to a plurality of protocols for non-IP digital PBX telephone handsets.

36. (Previously Presented) The method for translating call control signals between an IP network and non-IP digital PBX handsets of claim 34 wherein translating telephone call control signals occurs in a protocol translator circuit; and further comprising:

programming the protocol translator circuit to translate telephone call control signals from and to a plurality of protocols for IP telephone call controllers.

37. (Previously Presented) The method for translating call control signals between an IP network and non-IP digital PBX handsets of claim 34 wherein translating telephone call control signals occurs in a protocol translator circuit; and further comprising:

programming the protocol translator circuit by IP download via the IP port.

38. (Previously Presented) The method for translating call control signals between an IP network and non-IP digital PBX handsets of claim 37 further comprising:

establishing an IP session between a gateway and an IP service; and

initiating the download in response to establishing the IP session.

39. (Previously Presented) The method for translating call control signals between an IP network and non-IP digital PBX handsets of claim 34 further comprising:

receiving at the handset port a third non-IP digital PBX call control signal; and

returning a fourth non-IP digital PBX call control signal to the handset port without delivering a corresponding IP telephone call control signal to the IP port.

40. (Previously Presented) The method for translating call control signals between an IP network and non-IP digital PBX handsets of claim 34 further comprising:

receiving at a first handset port a fifth non-IP digital PBX call control signal; and

sending a sixth non-IP digital PBX call control signal to a second handset port.

41. (Previously Presented) The method for translating call control signals between an IP network and non-IP digital PBX handsets of claim 34 further comprising:

assigning an address for IP communications to each handset port to which a non-IP digital PBX telephone is coupled; and

registering each address for IP communications with the IP telephone call controller.

42. (Previously Presented) The method for translating call control signals between an IP network and non-IP digital PBX handsets of claim 34 further comprising:

routing non-voice IP data packets between the IP port and one or more IP sub-ports;

while providing quality-of-service preference to voice IP data packets translated to and from handset ports coupled to non-IP digital PBX telephone handsets.

43. (Previously Presented) The method for translating call control signals between an IP network and non-IP digital PBX handsets of claim 34 wherein delivering the first IP telephone call control signal to the IP port and receiving the second IP telephone call control signal from the IP port further comprises respectively transmitting and receiving corresponding electrical signals via plug-in contacts to and from a coupled IP telephone call controller.

44. (Previously Presented) The gateway of claim 1, wherein the one or more handset ports, IP port, and protocol translator circuit are disposed in a single housing.

45. (Previously Presented) The gateway of claim 1 wherein the one or more handset ports, IP port, and protocol translator circuit are configured to communicate through a fully digital signal path.

46. (New) The gateway of claim 1, wherein the gateway is further configured to automatically determine the operating characteristics of handsets coupled to each handset port by:

sending to each handset port a set of signals designed to produce a different response from each different proprietary handset that the gateway is intended to work with; and

processing the response that is received from each handset port to compare to data stored in memory to identify the type of handset on the handset port.